

C-10 Enhancements & Developments

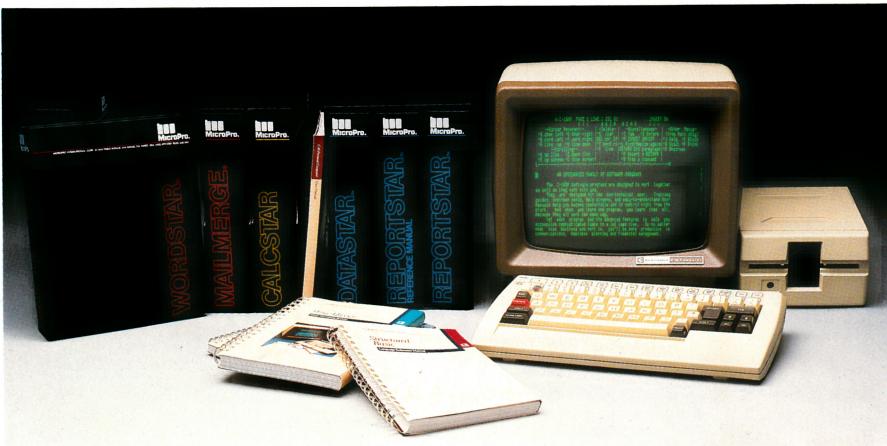
Cromemco Bundles MicroPro Software; Adds IBM Selectric Keyboard

New software offerings and an optional keyboard with numeric pad and 20 individual function keys were the focus of C-10 product introductions recently announced by Cromemco.

The keyboard, Model CKBC, uses an IBM Selectric style layout so that typists familiar with the IBM Selectric keyboard can comfortably make the transition to the C-10, thereby

everything included in that price:

- The C-10 Personal Computer with 12-inch display, keyboard, and 390K disk drive
- WordStar word processing program
- InfoStar data base management & reporting program
- CalcStar spread sheet program
- MailMerge file merging program
- WriteMaster word processing



reducing the future shock of moving from typewriter to word processor. The addition of a numeric pad and separate function keys act to increase operator efficiency and effectiveness.

The new software offering which bundles the most popular MicroPro packages, WordStar, InfoStar, CalcStar, and MailMerge will be good news for C-10 users who are accustomed to using MicroPro software. Designated the C-10MP, the new system carries a suggested list price of \$2,195. This turns out to be quite a bargain when one looks at

program

- PlanMaster spread sheet program
- MoneyMaster financial planning program
- CDOS (CP/M-like) Operating System
- Structured BASIC programming language
 - Screen Editor
 - Chess
 - C-10 Users Manual
 - BASIC Programming Manual
 - Complete documentation for all software programs

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DPU Price Reduced

The suggested retail price of the Cromemco DPU card has been reduced from \$995 to \$795. The DPU has both a Z80A and a 68000 processor on a single card which conforms to the IEEE-696 (S-100) bus standard. The DPU can directly replace the ZPU card in any Cromemco system. With this new pricing, the DPU has become even more attractive for OEM's designing 68000-based systems and for Cromemco users who are looking to upgrade their older ZPU-based systems.

Growing Pains Eased by Dealer Support

by Dennis Koenig

In order to keep up with the fast pace of change in small computer technology, the typical end-user needs to establish an on-going support relationship with a cooperative, technically proficient computer dealership or other support organization. This author highlights an example of the need for dealer support in coping with differences in disk drive interfaces.

The Growth

Along with Cromemco's shift from Persci to Tandon 8-inch floppy disk drives, there has come a minor flood of new 8-inch floppy Cromemco-compatible hardware. Users and vendors are scrambling to meet challenges posed by applications of the new Tandon hardware, particularly those applications in older systems.

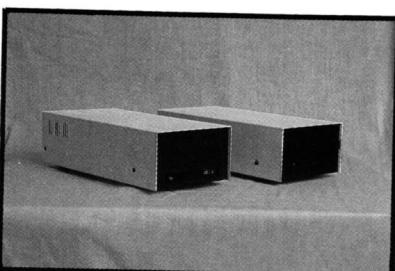
Cromemco's recently introduced CS-3A, the "Cadillac" of their S-100 product line, incorporates the Tandon TM-848 8-inch double-sided,

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DISK DRIVE SUBSYSTEMS

THE SOLUTION TO DISK STORAGE PROBLEMS

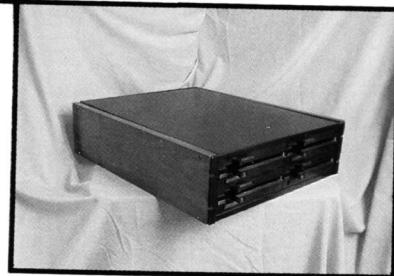
16 MB 5½" Hard Disk



5½" Stand-alone



**CDC Phoenix and
Lark Subsystems
(not shown)**



8" Combination Pack

8" Subsystem Matches System One

Disk Subsystems from the Butler-Griffith Group require **no hardware modifications**. Sixteen megabyte, five-inch subsystem for CROMIX*, stand-alone five-inch floppy systems, eight-inch drive subsystems to match the System One, and combination packs contain up to four, eight-inch slimline drives or, combined eight-inch drives and sixteen megabyte Winchester subsystems.

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FEATURES

All Floppy Disk Subsystems offer Double-sided, Double-density Storage. CDC Phoenix offers 96MB of storage. The 16MB Lark Drive has 8MB fixed and 8MB removable. The 96MB Subsystem has 16MB removable cartridges.

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We offer stand-alone 5½" subsystems designed for the user who has no 5½" drive, or requires an additional 5½" drive—Double-sided, Double-density. Stand-alone 5½" drive and dual half-size drives are available.

Our 8" tabletop package matches the Cromemco System One cabinet. The subsystem can be ordered with a single, Double-sided, Double-density drive or with dual drives.

No modifications to the floppy disk controller are required.

Our interface card inside the cabinet assures compatibility with the Cromemco 16FDC.

Drive Manufacturers Represented . . .

Eight-inch drives from Mitsubishi Electric and Qume; half-eight(8" & 5½")drives from Qume and Tandon.

Eight-inch Drive Specifications

3 ms track-to-track

Average access time, including head settling time: 91ms

Transfer rate: 500KBPS

Formatted capacity: 1.2 megabytes

Recording method: FM single-density; MFM double-density

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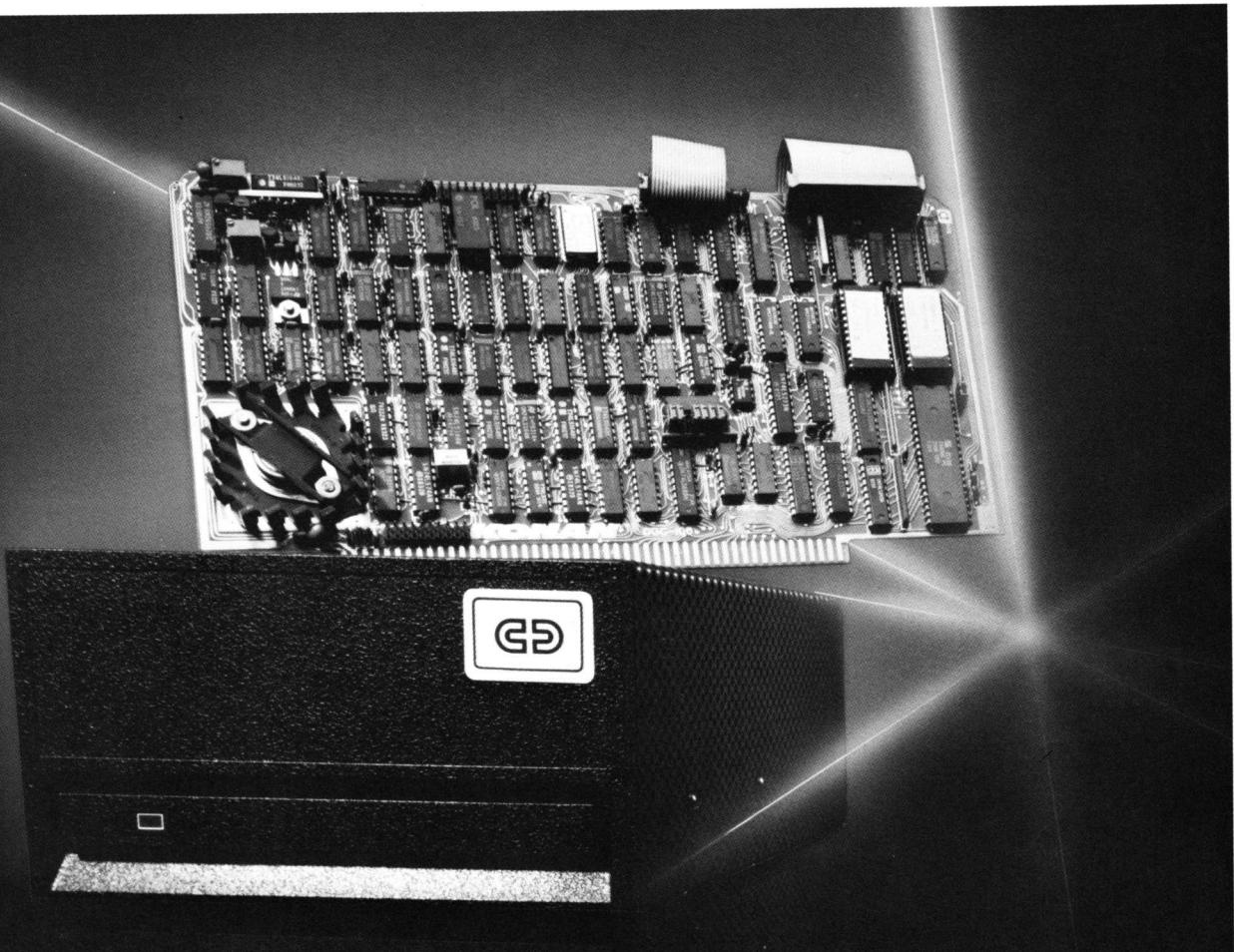
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* Configurations for CS-0, CS-1, CS-1H, CS-3, and Z-2H vary from \$3995. to \$4495.

I/O News

The Official Publication of The International Association of Cromemco Users is available through membership in the association. Editorial and advertising policies are designed for the enlightenment of the members in regard to new uses for, and developments of, Cromemco products and other products compatible with Cromemco systems.

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Art Direction
Jeffrey Frisch Design, Irvine, CA

user can change active fonts and colors freely to produce a slide that contains multiple style typefaces, as well as multiple colors. The program even allows for simple shapes (such as lines, boxes, and circles) to be drawn on the screen to enhance the overall image. The end result is simple, yet powerful, manipulation of text slides that do not require programming, or the use of text editors.

GRAPHTXT has been added to the FontMaster package (FOMR) at no added cost, and will be available through the Software Update Service (SUDS), as well as in new packages starting this fall. Also included with this new release will be nine new fonts bringing the total to 19 factory-supplied fonts. More are planned.

Yours truly,
Norm Miller
Product Marketing Specialist
Cromemco, Inc.

Editor:

Editor:

In Vol. III, No. 3, several questions were raised with regard to usage of Cromemco's FontMaster graphics development software. Some exciting new enhancements to our graphics software products are soon to be

input...

released which I believe graphics users will be pleased to know.

In the tradition of making the "Master Series" software truly user-friendly, a new program called GRAPHTXT has been developed. GRAPHTXT provides a whole new capability to FontMaster users by allowing them to create and modify slides on an interactive basis. Using any of the supplied fonts, or user-defined fonts from the FONT.COM font design software, GRAPHTXT provides menu-driven commands over the graphics screen, allowing text to be entered directly from the keyboard and moved freely around the screen, in any direction, a pixel at a time.

Resolution changes, mixed areas of resolution on screen, and a redefinition of the color map are all possible from within GRAPHTXT. The

The C-10 is advertised with pixel (160 x 172) and line (720 x 384) graphics modes. I am interested in accessing these graphics modes. Is it possible to access them from Structured BASIC? If not, how can they be accessed in Assembly language? I am also wondering if there is any good graphics program out for the C-10 yet.

Yours truly,
David Paulus
Milwaukee, WI

Dear Mr. Paulus:

These are good questions and ones we have never properly addressed. The first thing is, do not be misled about the graphics capabilities of the C-10. It is not intended to be a true high-resolution graphics system. What it does offer is limited graphics capability through character sets of 25 rows by 80 characters. The pixel count noted in some promotional literature is the simulated graphics resolution achieved by using the built-in character sets. We have a comment in "bits & bytes..." this issue regarding the necessity of acquiring the C-10 Technical Manual for those C-10 owners who want to experience the full benefits of their systems. Basically, the graphics sets are used in the same way as the other character sets as noted in that manual. Ed.

Editor:

I am continually impressed with the operation of Cromemco's C-10, both as a stand alone system and as a smart terminal for our large CROMIX system. We currently use three C-10s in various medical research labs. We access our System 2 Hard Disk when larger patient information files are needed.

As an added use, the C-10s act as stand alone data processors for large volumes of radioimmunoassay data generated by our research labs. However, processing this data requires a large amount of numerical data entry. Using the built-in C-10 numeric keypad is a great help, but key entry error is a constant problem. Our laboratory equipment is capable of punching paper tape with the data produced, but we have had no success in finding help in interfacing a paper tape reader to the C-10. An inexpensive (\$125.00) paper tape reader (Model OP-80A), available from Oliver Advanced Engineering in Glendale, California, comes with a standard parallel interface, but our local Cromemco dealer is unable to interface this device to the C-10.

We realize paper tape is an archaic form for data storage, but it is ideal for transient data capture before creating a disk file. We don't have to tie up the C-10 as a data capture device except for the final reading of the paper tape.

We would appreciate any help in interfacing this paper tape reader to the C-10, or in finding any other paper tape reader that could be used.

Sincerely,
Jerome A. Johnson, Ph.D.
Area Manager
Endocrine Laboratory, B200
The Methodist Hospital
6565 Fannin
Houston, TX 77030
Phone: (713) 790-3311

Dear Dr. Johnson:

After asking around and coming up empty, we printed your letter in the hopes that someone out there has already accomplished this type of interface and will contact you directly. Please let us know if you get a positive response and we will spread the word. Ed.



Exclusive Seminars for Cromemco Users

Bill Jaenicke, local software developer and editor of the department, **Inside CROMIX**, is acting as a consultant and parttime staff-member at I/O News. Due to Bill's involvement, we can now offer IACU-sponsored seminars almost anywhere in the world. He has been holding CROMIX seminars throughout Southern California for the past year, and has now agreed to take his seminars on the road. There are two levels involved in his seminar program. The first is (you guessed it—Level One) for users of CROMIX with more confusion than working experience with this sophisticated op-

The seminars are flexible. Bill's method of teaching requires that attendees achieve certain levels of proficiency before the seminar ends. Naturally, both the cost per person and the number of days involved vary directly with the number of people in each class. A full course syllabus and post-course telephone review service are available to all enrollees.

If you would like the opportunity to learn CROMIX from an expert, contact IACU for further information on how to set up a seminar wherever it may be convenient for you.

Speaking of Seminars

Norman Vadnais, editor of **Soft Tips**, is also offering seminars. His cover both dBASEII, and operating systems. Just about the same criteria for Jaenicke's seminars apply to Norm's. For further information, contact him at: Computer Specialists and Associates, 16691 Gothard, Suite G, Huntington Beach, CA 92647, or call him at (714) 841-3620.

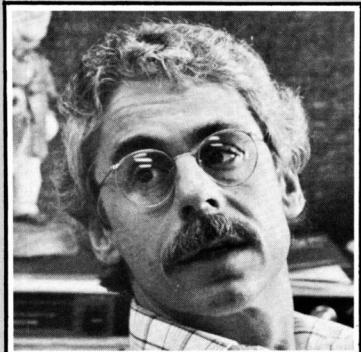
A Last Word on Seminars...

for the time being, anyway, comes from Richard Quinn. The popular author of **Tec Tips** would like to know if there are those around the country who would be interested in a Cromemco Camp-in. Quinn has a camper equipped with a special power supply that allows him to take a system with him when he gets away to the mountains or lakes. What he envisions is an encampment at one of the beautiful California campsites where trout fishing, or mountain climbing Cromemco users could gather with operational systems and swap stories, ideas, and programs. It could be held in any one of a number of ideal spots where cabins and food could be provided. His goal is for the CRAMP (CRomemco cAMP) to even become an annual event.

Quinn's vision, in his own words, follows: "Visitors from all over the world would be welcomed. The camp would be aimed at serious users and systems programmers and should prove to be of great benefit to companies who depend on Cromemco systems for data processing. The camp's target audience would be experienced users."



Lynn Platzek



erating system. The second level (yep—Level Two) is designed for those users with quite a bit of experience, but who know they really aren't using CROMIX up to its capabilities.

"The encampment would likely be in the California Sierra mountains and last for three to four days (and nights). We would hope to attract representatives from Cromemco, as well as other mainstream users and vendors. These guests would provide the forum for the expression of new ideas and solutions to existing problems.

"We would try to get the latest applications software for demonstration and hands-on evaluation. We anticipate having enough systems available so that only a few would have to share terminals. It could also become an annual computer fair, of sorts. A place to promote new software and demonstrate innovative solutions.

"Sessions would include exploring both hardware and software. It would be structured so that there could be more generalized group sessions, followed by opportunities to divide into special interest groups. Session times could be structured, but flexibly so as to allow for schedule changes. If one wanted to skip sleep to spend that time at a terminal, fine. It may give that person the chance to rub shoulders with the MOST COMPETENT CROMEMCO USERS IN THE WORLD! It would also form a basis for future encampments. One could learn in a few days from others what might have taken weeks, or even months, to learn in books, or via phone.

"We are guessing that the cost would be in the \$200-\$300 range for room, board, session notes, and ground transport to and from airport. Prices are nowhere near firm, and I would appreciate your budget desires. Also, let me know whether an "outdoor" camp, or a fancy hotel would be more desirable.

"I expect the inaugural encampment to be small in numbers (20-50 CRAMPERS), but huge in quality. I know it could be a powerful, exciting environment to form strong bonds with those who share common ideas and desires. Please call me at (213) 889-4819, or write me, Rich Quinn, at 30313 Canwood, Agoura, CA 91301.

I'll keep everyone informed of all progress through the pages of I/O News.

Richard Kaye
Editor

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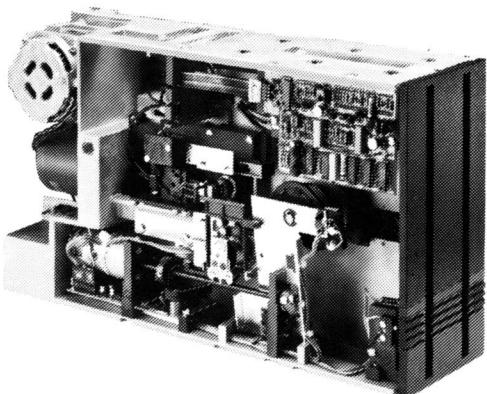
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The Standard in Service

Growing Pains Eased by Dealer Support

double-density floppy drive, among several substantial improvements to the old CS-3. Accommodations for the TM-848 included the introduction of the DPS-3 drive power supply (integral to the CS-3A), the temporary 16FDC-T, and its successor, the 64FDC. These new products were necessitated, at least in part, by the electrical differences between the Persci and Tandon drives. Now, OEM's dealers and systems houses across the country are offering various versions of TM-848 subsystems as add-on upgrades to the earlier non-Tandon systems. Prices for the TM-848 add-ons range from about \$1000 to \$2500, depending upon existing hardware and the configuration of the new subsystem.

The Pains

Many users have had difficulty securing reliable local repair services for their Persci drives. They would be glad to trade them for the TM-848, with its simpler design (though sacrificing the significantly higher speed of the Persci). But they are reluctant to pay for the new controller and power supply.

There are also many CS-3 and PFD (the old Cromemco stand-alone Persci unit) users who are happy with their Persci drives, but who would like to add more floppy drives to their systems. At first glance, the TM-848 is often more appealing than the Persci 299B. Still, these users face the problem of "incompatibility" between their Persci and the prospective TM-848.

CS-3 owners are not alone. Owners of the CS-1H and Z2H (now revised to CS-2H) are looking for 8-inch drives to supplement their 5-inch floppies and backup their hard disks. They, too, have a compatibility problem between the TM-848 and their existing 16FDC's.

Cromemco generally maintains reasonable degrees of upgrade compatibility as their product line changes to remain abreast of surging micro-system technology. For

example, all three Cromemco hard disks (HD11, HD5 and HD20) will run on the same WDI-II interface board. As for floppies, however, even their latest interface board, the 64FDC, is not "plug-in compatible" with all four of the drives found in Cromemco systems (Persci 277 & 299B, Tandon TM-848 & TM-100). The faithful Cromemco user deserves answers to such questions as: "Why can't I add a TM-488 to my system without sacrificing my Persci and/or sustaining the expense of major hardware modifications? Why can't I add a TM-100 (5-inch floppy) to my CS-3, to gain 8-to-5-inch software portability? Why can't I add a TM-848 to my Z2H?"

In answer to such questions, the user needs to be informed of two very important facts. First: with the help of an honest, truly concerned, technically proficient dealer who specializes in Cromemco systems, almost nothing within reason is IMPOSSIBLE. Second: Persci and Tandon drives are not so greatly incompatible that they cannot both run on a standard 16FDC with minimal and inexpensive adaptations.

On the surface, there appear to be three alternatives for expansion of permanent media storage in a floppy-based Cromemco system:

- 1) Pay about \$2500 for another Persci (and even more for a stand-alone Persci subsystem), or,

- 2) Ditch the Persci in favor of a TM-848 subsystem with its 16FDC-T or 64FDC controller and different power supply, and the associated expenses, or,

- 3) Buy a hard disk subsystem!

But each of these alternatives bears negative consequences, varying in degree according to the user's specific situation. Moreover, these approaches are likely to prove somewhat simplistic and inadequate in fulfilling complicated real-life application needs at reasonable prices.

A Classic Case

Mr. Robert Schwartz (IACU member #324), President of Sum-

mit Realty Corporation in Elmsford, NY, has run the gamut of peripheral interfacing difficulties as he has over the years been steadily expanding a CS-3, largely without the help of a local dealership. The system was originally single-user CDOS with a Persci 277 8-inch floppy controlled by a 4 FDC. Eventually he upgraded to two-user CROMIX and an external dual TM-848 subsystem. The vendor of the TM-848 subsystem provided a 16FDC with a modified data cable allowing him to run the Tandons as drives A and B, with the 277 configured as drives C and D.

Later, Mr. Schwartz bought the HD5 hard disk, installed it in the CS-3 next to the 277, and upgraded to CROMIX version 11.11 (for compatibility with the HD5). To his dismay, he found that he lost double-sided capacity on the Tandons under the new version of CROMIX. To regain this lost feature, it appeared that he would have had to either

- 1) Give up the 277 and purchase the Tandon-compatible 16FDC-T or 64FDC, or,

- 2) Give up the hard disk and return to CROMIX version 11.05, or,

- 3) Limp along with single-sided operation of the Tandons.

Complicating matters, along came the C-10 personal computer. Mr. Schwartz bought one to use at home. Now he needed a 5-inch floppy drive on his CS-3 to allow software portability between it and the C-10 at home. But the 16FDC is normally limited to four floppy drives (A, B, C, D), which he already had.

The Dealer Support

After consulting with a Cromemco full-service dealership newly established in his local area, he learned not only that it was easy to add the TM-100 mini-floppy drive, but that he could also regain double-sided operation of the TM-848's. The dealer produced a solution that allowed him to keep all of his existing hardware and the latest ver-

sions of CDOS and CROMIX.

Well, to make an already long story a little shorter, Mr. Schwartz's CS-3 has evolved to include all of the following: 3-user CROMIX 11.16; 3102 terminal, Infoton Terminal, C-10 terminal; IOP and QUADART; Texas Instruments serial dot matrix printer, NEC 5510 serial letter quality printer (with capability for switching its data host from the CS-3 to the C-10); two TM-848 ds/dd 8-inch drives, TM-100 ds/dd 5-inch drive, Persci 277 dual ss/ss 8-inch drive, and HD5 hard disk.

Through the use of a specially designed data cable assembly provided by his local Cromemco dealer, Mr. Schwartz is now running his FIVE floppy disk drives, each fully operational, with his original 16FDC. No modifications to the 16FDC, TM-848, TM-100 or 277 were required...a nice circumstance, should the need arise for a standard service replacement. (The dealer offers rentals during repair periods. Of course, it is impractical for him to make special modifications to standard rental units for each rental cycle.)

It has also been proven that the TM-848 can run on the old CS-3's DPS-2 drive power supply, with only a minor DC power connector modification.

The crucial factors contributing to the reconciliation of Mr. Schwartz's disk drive interfacing differences were:

1) Confidence in the Cromemco product line. He knew from experience that his Cromemco system was flexible enough to handle "sticky" situations, although such situations occasionally require specialized technical support, and,

2) The development of a close, friendly relationship with a cooperative and technically knowledgeable local full-service dealership, and,

3) Determination to not give up his old reliable, high-speed workhorse, the Persci 277!

He did not always have that local dealership to fall back on. They came onto the scene some time after he had purchased the Tandon and hard disk subsystems (from a less readily available source). Since the new dealership opened in his area, Mr. Schwartz's system has grown in capacity and capability, and he has

grown considerably more knowledgeable about the technical aspects of his computer operation. And he has become convinced of the need for a solid support relationship with the dealer.

Cromemco's dealer network exists for good reasons other than sales advantages. Users should insistently and consistently take advantage of it. You "loners" out there may not know what you're missing!

About the Author

Mr. Koenig is the Systems Support Manager of a microcomputer systems house in the Metropolitan New York City area. He will gladly answer IACU members' questions regarding peripheral interfacing, and any other support questions. He may be contacted at: Computer Closet, Inc., 45F Route 303, Valley Cottage, NY 10989. Phone: (914) 268-5161.



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tec·tips

TEC TIPS is a regular column aimed at providing hints for keeping systems up and running. It will not attempt to deal with specific engineering applications or non-standard configurations. TEC TIPS is edited by Richard Quinn, owner of QUINTEC, a Southern California Computer service firm.

Adding A Second Floppy Disk To A C-10

Several C-10 owners have opened up the second disk drive to change the address header to a different drive address only to discover that the drive would not work afterwards. There is a dip header on all five inch drives that is used to set their addresses (a, b, etc.).

Cromemco has used a special connector and wired it to change addresses as the connectors are stacked on top of each other. Therefore, do not change anything in the drive or addressing will be fouled up. Address of the drive is determined by its physical location in the connector stack and not by its header. That means that the first connector on the system will be drive "A", the second drive "B", etc. This also means that if the drives need to be repaired, simply removing the bad drive will allow you to move the good drive to the "A" spot.

Unless something is wrong with the drive, you should not need to ever remove the covers for the address changes.

Version 2.56 CDOS Has Hard Disk Bug

The current version of CDOS, which is version 2.56 at this writing, has a problem when more than one hard disk drive is on the line. Say you have drive one installed as "E" and drive two installed as "F".

When you boot the system, you can go to drive "F" and read or write in a normal fashion. If you then go to drive "E" it too appears normal. On returning to drive "F" it will seem as if the drive has gone dead and only generate "drive not responding" errors. If you re-boot the system without any other changes, you will then again be able to read drive "F".

This creates a problem when your desire is to have more than one

drive on the line for backup or other functions. If none of the drives is the HDD-20 (newest hard disk) then continue using an earlier version of CDOS (2.52 or so). The main reason 2.56 came out was for the 20mb drive.

There are no problems under CROMIX. Two or more drives of any size seem fine under CROMIX. The problem is not hardware and is limited to CDOS systems, most of which have only a single drive anyway. If your system has a single drive of any type, version 2.56 seems fine. If your CDOS system has a 20mb drive then you must use version 2.56 as this is the only version to support a 20mb drive.

Bug In CROMIX Version 11.16 Typ Drivers

I have experienced a bug in the "typ" drivers for the Cromemco 3355, 3355A and 3355B printers. Our system, which uses the original Qume 3355 Cromemco model printer seemed to have random system lockups when accessing the letter quality printer. The problems never occurred with any other printers, either parallel or serial.

At first, I thought the problem was strictly a hardware problem with our printer. I made new cables, changed cards in the computer and printer and even changed power supplies in the printer. After all this, the puzzle was still with us.

The problem manifested itself like this: when printing to the printer from a program such as the screen editor or BASIC applications all seemed fine until the second program accessed the printer. That is to say, if I printed a page in the screen editor and then loaded and printed pages of the BASIC program, the printer would hit the "crash" stops at the end of its travel and go off line often taking the system with it. Occasionally it

would not crash the system and could be reset using the following command file called reset.cmd:

```
daemon /dev/typ1  
echo> /dev/typ1 ""  
(value 7Fh in quotes)
```

The value in the quotes is 7F hex, thus it does not display in ASCII. We created the command putting any single ASCII character in the quotes and then used DEBUG or PATCH to change it to 7F hex. The 7F should reset the driver and clear all within.

Often when resetting the driver we would get a portion of the system memory printed and then the system would crash. This would cause a greater problem in that it could unpredictably damage the hard disk file system and cause a possible loss of data. Usually the damage was recoverable but on occasions we would see files appended to each other, in particular if the files were being accessed by other users.

A further symptom was discovered. The problem will almost without exception occur if a line sent to the printer is not ended with a carriage return, or output is redirected to the printer using the ">" command but aborted prior to completion of print. Also, if a print is aborted from an application program like Screen or SuperCalc, expect the problem. The next time a line of information is sent, the printer will hit the crash stops or print garbage.

My guess is that the buffer area used by the "typ" driver in inverting the printed line is re-used by the operating system and that is where the garbage comes from. We have temporarily solved the problem by running the reset command before any access and being careful to end each line with a carriage return.

The newest printers, the 3355A and the 3355B don't seem as likely to cause the problem as they are better about not crashing against the stops if an illegal instruction is sent. Often the printer will reset itself and pick up at the next line

Continued on next page

tec-tips

and this may be why more folks have not had a worse problem.

What Is A 3355 Printer?

Cromemco sells the 3355 printer in several models. It is their main line of letter quality printers and there has always been some confusion as to its nature and origin. I'll try to explain away some of the confusion.

The 3355 was the model number of the original Qume letter quality printer offered by Cromemco and other computer manufacturers. It was popular because it was one of the first, low cost, high quality, daisy wheel printers to offer truly proportional spacing in a small printer. Many other manufacturers of quality word processing equipment also used this popular printer. Interfacing to the Cromemco requires use of the PRI card and the 3355 software driver in CDOS or the TYP driver in CROMIX. No other interface cards will drive the 3355 series of printers. (Note: Cromemco's PRI card has two parallel interface ports, Port 1 for the Qume interface, and Port 2 for the Centronix interface.)

The trick was that the printer did not communicate in a simple ASCII character fashion. It had a large command word that included bits for spacing as well as forward and reverse print and other attributes. The PRI interface cards were developed to handle many of the special needs for this Qume interface, and they did so very well.

As Qume sales increased, it became increasingly harder to depend on the company for timely deliveries and Cromemco, like others, looked around for alternate sources. In comes NEC of Japan with the Spinwriter series of printers. The Spinwriter was offered with a large variety of interfaces including serial and parallel, standard and non-standard. It was a high quality printer and readily available in the Qume-like interface and Cromemco made the change. NEC still manufactures one of the best letter quality printers in the market and has captured a great deal of the business.

This new letter quality printer was designated the 3355A by Cro-

memco even though it was a whole different printer. The interface remained the same, via Port 1 on the PRI card. It was a full implementation of the old Qume interface with very few changes. The NEC Spinwriter was sold under models 5500Q or 5503. The printer featured 3 logic cards and a switching power supply.

At a later time, the Spinwriter was changed to a single logic card and relabeled the 7700 series. Cromemco maintained the basic 3355 model number but called it the 3355B. Everything else was the same and the unit is still the Qume interface.

The 3355 Cromemco series are the only printers that implement all features of the Cromemco software (namely WriteMaster). That is, it will do underlining, bold face, true proportional spacing, super- and sub-scripting and so forth. Other printers supported by Cromemco will generally only implement a few of these features, different printers doing different things. Usually if the printer is not able to perform the function, the feature is ignored.

Most of the other printers sold and supported by Cromemco use the industry standard Centronics interface which is a simple 8-bit ASCII parallel interface. Interface hardware is through the second port on the PRI card (not the same as the 3355) or one of the two parallel ports on the TUART card. In some cases even the parallel ports on the single card computer (SCC) can be used. Commands to Centronics-like printers are in the form of ESC sequences or control characters instead of control bits or lines as in the case of the 3355 series.

The C-10's main printer is the CLQ which is a daisy wheel serial printer. The C-10 can support any of the Centronics-like interface printers, but not the Qume-like interface, thus not the 3355 series printers. It supports most serial interface printers via the printer.com utility. However (and I hope this changes soon) most of WriteMaster's features will be lost when using other printer drivers, as the control codes for these different printers are not implemented. Where possible, we try to use the serial CLQ driver with the C-10 to get the most features from the

printer. The latest C-10 technical manual gives a complete description of the printer drivers and what is done by each.

Dial-Up Bulletin Boards

We are wondering whether or not anyone out there is interested in a dial-up bulletin board service. We would like to see technical information, program swapping, Cromemco user group news and used hardware information on the system. Our problem is finding out if users would really be interested as you are all spread so far apart you may not use it due to the costs of long distance phone rates. We would propose a 300/1200 baud dial-up system using CROMIX. If you are interested, please let Dick Kaye at the I/O News know. If there is enough interest maybe we can get something going.



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Recent Activities of Local Users' Groups:

Cape May, New Jersey was the site of an extra-special, day-long outing/meeting of the Microcomputer Users' Group, MUG, and their families. Among the scheduled activities were: an Open House at the Cape May City Hall which provided a 'hands-on' opportunity to explore the multi-user Cromemco System 3 and to learn how local governments utilize micro power (data base management, word processing, financial, communications, spreadsheets, budgeting, etc.); a trolley tour of the National Historic Landmark City; a showing of Victorian Capers—a documentary film; dinner; and, finally, the MUG meeting consisting of a potpourri program of interest to micro users.

CUGH, Cromemco Users' Group Holland, has grown to 35 members. Members, professions range from hard—and software professionals to university members, college teachers, administrators and physicians. Therefore, sub-groups were initiated on various subjects. A professional software manager supervises a CROMIX and an S-BASIC group. Hardware problems are handled by a hardware specialist and group members are presently interested in help in understanding hardware and I/O with printers and terminals.

At a recent meeting, the Arizona Association of Cromemco Users held in-depth discussions on operating systems and utility programs. "CDOS is considered by many in the industry as being top notch and the 'utilities' are programs that work with the operating system giving us useful information and/or doing useful tasks," said JoAnn Drake. The less experienced user found this discussion particularly useful as he was able to look at what an operating system does and how it can be made to work for him. Following the discussion, time was devoted to a free-for-all question/answer session on any topics of interest.



Local Cromemco Users' Groups

Arizona Association of Cromemco Users

Contact: Jo Ann Drake, President
2207 West Eugie Avenue
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Bay Area Cromemco Users & Programmers (BACUP)

Contact: Raymond Barglow or Alan Walworth
United Word & Data Processing
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Berkeley, CA 94704
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Cromemco Users' Group Holland (CUGH)

Contact: Joop Kohler, Secretary
P.O. Box 120
2910 AC Nieuwerkerk a/d IJssel
The Netherlands 01803 - 3300

Greater Dallas Area Users' Group

Contact: Lee Dixon
2629 Stemmons Freeway
Dallas, TX 75204
(214) 638-4477

Greater Detroit Area Users' Group

Contact: Frank D. Baber
P.O. Box 909
Warren, MI 48090
(313) 575-4607 or 759-2152

Cromemco Users' Group

Contact: Peter Norman
The University of Newcastle Upon Tyne
Department of Chemical Engineering
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Contact: Zafir M.A. Pontoh
Computation Lab
Department of Regional &
City Planning
Bandung Institute of Technology
10 Ganesha
Bandung, Indonesia
(022) 82051 ext. 360
* Publishes "BERKALA ICUG,"
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Microcomputer Users' Group

Contact: Jim Lenz
1165 Barbara Drive
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(609) 428-6701

Netherlands Users' Group

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The Netherlands
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Cromemco Bundles MicroPro Software; Adds IBM Selectric Keyboard

Continued from front page

Thus, the C-10MP includes all the software presently included with the C-10SP as well as the MicroPro bundle. For those existing owners of C-10SPs, the MicroPro software will be made available as an upgrade and can be obtained from Cromemco dealers as Model MPS.

Why all the fuss about MicroPro? Well, those who have used that company's software over the years know why it has become so popular. For those who haven't, a brief review of the attributes of all the software included with the C-10MP is in order.

WordStar Word Processing System (by MicroPro International)

The most popular word processing program on the market today, WordStar's capabilities increase the user's

reports can then be prepared from the data. InfoStar provides four levels of HELP menus to guide the user through each step of data entry and report generation.

CalcStar Spread Sheet Program (by MicroPro International)

CalcStar is an easy-to-use electronic spreadsheet that formats a matrix of up to 563 cells on the C-10. It includes the traditional four arithmetic functions plus advanced math capabilities such as logarithms, exponents, and linear regression.

MailMerge File Merging System (by MicroPro International)

MailMerge permits the personalization or customization of prepared text. It allows merging from a file or directly from a keyboard, such as for form letters.

WriteMaster Word Processing Program (by Cromemco, Inc.)

standard calculations. Other, more sophisticated, types of calculations can be defined by the user.

MoneyMaster Financial Planning Program (by Cromemco, Inc.)

MoneyMaster is a program for tracking and analyzing investments. It offers such features as computing stock yields, stock and bond buy prices, bond yield-to-maturity, real estate after-tax yield, and break-even analyses.

Structured BASIC (by Cromemco, Inc.)

Structured BASIC, a slightly reduced version of Cromemco's much-praised 32K Structured BASIC, is a high capability, easy-to-use programming language for user-originated programs.

Screen Editor (by Cromemco, Inc.)

Screen Editor is an easy-to-use text editing system, especially well-suited for creating files or writing programs.

CDOS Operating System (by Cromemco, Inc.)

The CDOS operating system manages the C-10 computer for the user. CDOS is a CP/M-like operating system, menu-driven and designed for ease of use. It includes all utilities necessary for efficient professional operation.

Those familiar with the C-10SP are aware of the hand-holding menus that lend so much to the ease and speed with which one can soon become competent on the system. Cromemco developed similar special menus for each of the MicroPro programs included with the C-10MP software bundle. Presumably, the MicroPro software will be as smooth and easy to use as the Cromemco software is now.

With the addition of the new keyboard and the MicroPro software, Cromemco quadruples the turnkey options available on the C-10. And, Cromemco has done so with the most modest of price increments. The difference in price between the C-10SP (SRP = \$1,785) and the C-10MP (SRP = \$2,195) is far less than the normal value of the software. We receive many calls each month regarding WordStar and SuperCalc, and it will be worth watching the reaction to these most recent additions to the C-10 offerings.



Cromemco Model CKBC Optional Keyboard

productivity in the writing and editing of text material. WordStar features operations to move, insert, format, underline, and boldface, among other necessary writing functions.

InfoStar Data Base Management System (by MicroPro International)

InfoStar provides a user the tools to maintain data records, including adding, deleting, or changing records. Simple, preformatted reports, or more complex customized

WriteMaster is a convenient, extremely easy to learn and use word processing program written specifically for the CDOS operating system. It features complete text editing capabilities as well as special formatting features for improvement of text appearance.

PlanMaster Spread Sheet Program (by Cromemco, Inc.)

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An Introduction to Cromemco T.M. 32K BASIC
by Wayne T. Watson, 190 pages.

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C-10 Technical Reference Manual

Cromemco has just published a Technical Reference Manual for its C-10 computer. The manual includes circuit diagrams, service procedures, software information, system call descriptions, and application notes. This new manual is available from Cromemco dealers for \$35.

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Inside CROMIX

William E. Jaenicke is an independent software consultant and president of SASi (Satellite Accounting Systems, Inc.). In addition to the SASi General Ledger, his firm also developed QTS, a time-keeping and time management report package for professionals. He has been working with Cromemco systems for more than four years, including almost three years of experience with CROMIX. Jaenicke holds regular monthly seminars on CROMIX in his Newport Beach, California offices. He can be reached by phone at (714) 955-2220.

Error corrections:

In last issue's column (Vol. III, No. 3) there were a couple of errors: First, it was stated that either Version 00.27 or Version 00.34 of the CDOS Simulator could be used: this is **not** the case. **Do not** use Version 00.27.

Second, there were some typographical errors in the CLEAN.CMD command file: the parenthesis "()" should have been curly brackets "{ }".

NOTE: I was informed by Bernie Thomas that when using 32K KSAM, and addressing files on different drives/directories, file handling errors are still generated. Apparently the method outlined in the last article does not work in all instances, although it did solve some problems with other CDOS software. Since the majority of Bernie's applications are run under 32K Structured BASIC, with KSAM, his only recourse was to stick with the CROMIX 11.16 simulator.

Running CP/M or CDOS Software Under CROMIX

As Tom McCalmont pointed out in his comparison of CROMIX and UNIX (Vol. III, No. 3), a prime design consideration for CROMIX was to "preserve compatibility with the wide existing base of Z-80 software for the CP/M operating system." In other words, CROMIX had to be able to "think" like CP/M, and to speak its language. This talent for translation, changing CP/M system calls into CROMIX system calls, is imparted by the CDOS Simulator program, SIM.BIN. What gets lost in the translation is the hierarchical file structure of files within directories within directories.

When dealing with files while running under the CDOS Simulator, file references must be restricted to the Current Directory, or at most to a

limited set of directories with names such as /B, /C, ... /H which CP/M or CDOS recognize as B: or C: and so forth. This implies, for example, that programs which are written in 32K Structured BASIC, which is itself designed to operate under CDOS, can locate files with names like "thisfile.dat" (in the current directory) and "c:letter" (the file "letter" in the /C directory) but would fail utterly in an attempt to locate the file "/usr/joe/myletter" (the file "myletter" in the /usr/joe directory).

Let's look at an example situation, and see what these restrictions imply. Imagine a multi-user environment where there are three people that perform distinct word processing tasks. They utilize WriteMaster as their word processor. Furthermore, each person has a separate directory on the hard disk dedicated to his own text files. In order for each person to be able to call up WriteMaster from his own directory, the set of WriteMaster programs must be present in each person's directory. Somehow this seems redundant and wasteful. If only there were a way to share the WriteMaster programs so that only one copy need be present. CROMIX does, however, provide nicely for this situation.

First, I should mention that if WriteMaster consisted of the single program WMASTER.COM there would be no problem. The file (program) WMASTER.COM could be placed in the /BIN directory, and then be run from any directory. When you enter the command "wmaster" CROMIX searches the current directory for a file named WMASTER.BIN or WMASTER.COM or WMASTER.CMD. If it is found the file is executed. If not, it searches for the file /BIN/WMASTER.BIN or /BIN/WMASTER.COM or /CMD/WMASTER.

ER.CMD. Only after these searches failed would the error message 'Command not found: "wmaster"' be displayed.

Since WriteMaster (version 00.46) consists of the three files WMASTER.COM, WMAST046.HLP and WMASTER.TAB, it does no good to place them in /BIN: the files WMAST046.HLP and WMASTER.TAB would not be available to the CDOS Simulator if WriteMaster were called from any other directory. The solution to the problem is to **link** the WriteMaster programs to the current directory.

A link is a way of sharing a commonly used file. The file need only be physically present in a single location (directory), although it may appear in many other directories, namely, those to which it has been linked.

The **link count** is an intrinsic characteristic of all CROMIX files. When you list a directory using the "L" shell command, four columns of information describing the file list are presented: the size of the file in bytes, a "D" if the file is a directory, the number of links to the file, and the file name. When a file is first created there is only one (1) link, and that is to the directory in which it was created.

Additional links to a file are made using the **MAKLINK** utility of CROMIX. The syntax for the MAKLINK utility is straightforward:

maklink [-vf] (file list) (directory)
OR

maklink [-vf] (source file) (destination file)

There are two options available (enclosed in square brackets above). The first is the **v**, for **verbose**, option. When this option is employed the names of the files are displayed as the links are made. The other option, **f**, is for **Force Delete**. If this option is used, the new link will overwrite any existing links. If the "f" option is not used, and a file exists with the specified pathname, an error will be generated and the link will not be made.

In the first syntax case, a file, or list of file names is specified followed by the pathname of the directory to which the files are to be linked. When used in this fashion, the file-

Continued on page 20

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Inside CROMIX

names remain the same in both the source directory and the directory to which they were linked. For example, the command:

```
maklink -v letter myfile.dat
/usr/joe
```

would result in the files "LETTER" and "MYFILE.DAT", present in the current directory, to appear also in the /USR/JOE directory. The link count for each file would be incremented by one.

In the second case, the pathname of the source file is specified followed by the pathname of the destination file. In this case, the name of the file in the destination directory need not be the same as the file in the source directory. For example, entering the command:

```
maklink -v /usr/ann/notes.txt
/usr/joe/notes.ann
```

results in the file "NOTES.ANN" appearing in /USR/JOE.

There is an important difference between linking files and copying files. When a file is copied from one directory to another, the copied file is in all ways separate and distinct from the source file. Changes made to the original file do not appear in the copy, and changes made in the copy are not reflected in the original. When a file is linked to another directory, the linked file is not separate. Changes made to the linked file in one directory are reflected in all other files to which it is linked. So when Joe modifies the file "NOTES.ANN" in his directory, he is also modifying the file /USR/ANN/NOTES.TXT.

Links to a file are broken by the **DELETE** or **DEL** command. For example, if Joe were to delete the file "notes.ann" from his directory the file would no longer appear in his directory. The file would still exist as /USR/ANN/NOTES.TXT, but the link count would be reduced to one (1).

Back to our sample situation, and how to link the WriteMaster programs. Let's assume that the WriteMaster software had been installed on the CROMIX hard disk using the **INSTALL** command. There would then be a directory called /USR/PKG/WRMR which would contain the WriteMaster files WMASTER.-

COM, WMST046.HLP, and WMSTER.TAB. These could be linked to Ann's directory by entering the following commands:

```
# d /usr/pkg/wrmmr (make
/usr/pkg/wrmmr the current
directory)
# maklink -v *.* /usr/ann
(ambiguous file reference *.*.
matches all)
/usr/ann/wmaster.com
/usr/ann/wmst046.hlp
/usr/ann/wmaster.tab
```

The WriteMaster system could now be run from the /USR/ANN directory. A similar sequence of commands could be used to set up WriteMaster in any other desired directory. This is all well and good, but it would be nice if you could call WriteMaster from ANY directory. In the WriteMaster Installation Instructions the commands for a command file to do this are presented. The idea behind this command file is that if the WriteMaster programs are in a specific place, such as /USR/PKG/WRMR, they can be linked to the current directory, the WriteMaster program executed, and afterward, be deleted from the current directory. Here's the command file to do the job, which is called WMASTER.CMD and should be created using the SCREEN Text Editor in the /CMD directory:

```
% WMASTER.CMD
% Enable users to call WriteMaster
from their current directory
if -rw . goto continue
echo -en 'Directory not accessible:
'; d; exit
%continue maklink -f /usr/pkg/
wrmmr/wmst046.hlp .
maklink /usr/pkg/wrmmr/wmaster.tab >* /dev/null
/usr/pkg/wrmmr/wmaster
del wmst046.hlp
wmaster.tab wmaster.tab >
/dev/null
if -err exit
del wmaster.tab
```

The first line in the command file checks that the user has READ and WRITE access for the current directory. If not, the next line is executed which displays a message and then exits the command file.

If the user has the required access privileges, the commands following the %continue label are executed. The first of these links the WMST046.HLP file in the /USR/PKG/-

WMMR directory to the current directory. Notice how the current directory was specified by using the period, "...". Also note that the "-f" option was used to overwrite any existing links.

Next, the file WMASTER.TAB is linked. In this case the -f option is NOT used. This is because it is desirable to keep any existing TAB file. Normally an error message would be displayed if the file already exists, but the error message is redirected to the "bit bucket" file, /dev/null, by using the error message redirection symbol ">*".

Having linked the HLP file and the TAB file, WriteMaster is called by the command /USR/PKG/WMMR/-WMASTER. It was not necessary to link the WMASTER.COM file to the current directory since it could be called by giving its absolute pathname.

After the user exits WriteMaster, the command file DELETES the .HLP file. The .TAB file is deleted only if it is the same as the one in /USR/PKG/WRMR, i.e., only if it wasn't changed. If changes were made, it is left alone. This check is made by using the COMPARE utility with the "t" (terse) option. If the files which are compared differ at all, the error flag will be set. This is checked by the "if -err exit" which causes the command file to be terminated before deleting the .TAB file.

With this command file present in the /CMD directory it is possible to use WriteMaster in any directory for which the user has read and write access. This command file serves as a model for designing similar command files for executing other CP/M software such as dBASE II, MultiPlan, and WordStar.

As a final example, a command file to allow dBASE II to be called from any directory is presented. It is called DBASE2.CMD and should be created in the /CMD directory. It assumes that the dBASE II programs reside in the /USR/PKG/DBASE directory.

```
% ****
% DBASE2.CMD
% ****
% This command file will link all of
% the necessary dBASE II overlays
% to the users current directory,
% and call the dbase program. It as-
% sumes that the dbase programs
```

Continued on next page

```
% reside in the /usr/pkg/dbase
% directory
if -rw . goto continue
echo -en 'Directory not accessible:
  ;d;exit
%continue
% Link dBASE II overlays
echo "Linking dBASE II overlays"
maklink -f /usr/pkg/dbase/-
  dbaseapp.ovr .
maklink -f /usr/pkg/dbase/-
  dbasebro.ovr .
maklink -f /usr/pkg/dbase/-
  dbasejoi.ovr .
maklink -f /usr/pkg/dbase/-
  dbasemai.ovr .
maklink -f /usr/pkg/dbase/-
  dbasemod.ovr .
maklink -f /usr/pkg/dbase/-
  dbasemsc.ovr .
maklink -f /usr/pkg/dbase/-
  dbaserpg.ovr .
maklink -f /usr/pkg/dbase/-
  dbasemsg.ovr .
maklink -f /usr/pkg/dbase/-
  dbasesrt.ovr .
maklink -f /usr/pkg/dbase/-
  dbasettl.ovr .
maklink -f /usr/pkg/dbase/-
  dbaseupd.ovr .
% Disable CNTRL C
mode — ab
% Call dBASE
/usr/pkg/dbase/dbase #1
mode ab
% Delete linked dBASE overlays
del dbase*.ovr *msg.com
% end of command file DBASE2.-
CMD
```

This command file can take the name of a dBASE II program as an argument. for example, the command 'dbase2 myprog' would link and load dBASE II and execute the dBASE II program MYPROG.CMD. If no argument is supplied, the dBASE II login routine is run.

A similar command file could be created for each type of CP/M or CDOS software that you wished to run. In most cases, there will be a single main program file with a ".COM" extension, and a number of overlays, usually with a ".OVR" or ".OVL" extension. These will be the files that require linking.

CD

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Accounting Software Available for C-10

Interdiscipline, Inc., a Cromemco dealership in Seattle, WA, recently sent us a demo package called PROBOOKS. The software is currently under review by I/O News staff member, Bill Jaenicke, and will be reported next issue. Meanwhile, for those of you who may want to do your own review, contact Rob Spooner at:

Interdiscipline, Inc.
403 S. Brandon
Seattle, WA 98108
Phone: (206) 763-2099

New Book for WordStar Users

SYBEX recently published a book for current or would-be WordStar users. Entitled, Practical WordStar Uses, Author Julie Ann Arca promises that even expert WordStar users who want to improve their knowledge of this powerful program will find the book an extraordinary guide. The book can be found at most computer or college bookstores, or at any computer dealership with a SYBEX rack.

More 68000 Software Emerging

ARCHITOP II, a software package developed in Germany for architects

and consultants, is now available for Cromemco D-Series systems. We would like to tell you a lot more about this package, but all the data arrived written in German. From what we could decipher, it appears to put strong emphasis on cost estimating, and is to be linked to a CAD program in the very near future. The combined software will allow architects to draw the project, specify the bill of materials, and the exact costs will be computed for the project. Further information can be obtained from:

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7150 Backnang
West Germany
Telefon: (07191) 62048
It may be wise to make any phone requests through a translator.

Any Ham Software Out There?

Jay Townsend, better known as WB7WSX, wants to exchange programs and ideas with other Ham radio operators. He is especially interested in software for interfacing Ham radios to Cromemco systems. Contact Jay at WB7WSX, or:

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will be interested in a new COBOL program generator just released by Automated Programming Methods, Inc., a long-time advertiser. The package, COBOL Programmer's Aide — II (CPA-II), allows the user to create fully structured, bug-free programs in a tiny fraction of the usual time. For detailed information, contact:

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And Even More 68000 Software

Access Consulting Company of Richardson, Texas, just announced the first complete petroleum library for a Cromemco 68000-based, multi-

user system. For all we know, it may well be a first for any microcomputer. The programs are designed to provide all the necessary tools for the engineer or geologist in reservoir simulation and/or economic evaluations. The programs are written in FORTRAN, and include a comprehensive library. More info? Contact:

ACCESS CONSULTING CO., INC.
1701 N. Greenville, Suite 1113
Richardson, TX 75081
Phone: (214) 644-5681

Many Queries on CAD/CAM Article

We have received calls and letters from many parts of the world regarding the article, MicroCAD/Me which appeared in Vol. III, No. 3. The article was written by Ari Feldman of Merav Technologies, Ltd., P.O. Box 32127, Tel-Aviv 61321, Israel. If you desire additional information about this reasonably-priced, highly flexible CAD/CAM software, please contact Feldman, or Yochanan Ron at the address above.

CP/M & SIG/M Libraries Available on Rental Basis

A new rental service for the CP/M and SIG/M libraries of Public Domain software has been announced by Paul Jones of Vista, California, a San Diego suburb. The idea is for a user to rent the library (or libraries) from Jones for a limited period of time, then return the master diskettes after copying whichever programs the renter wants to keep. There are 91 volumes in the CP/M library and 114 in SIG/M. If interested, contact Jones at:

P.J.S. Company
933 S. Santa Fe
Vista, CA 92083
Phone: (619) 727-1015

Useful Graphics Packages Offered

Leo E. Ofenstein, Professor of Mathematics and Computer Science at Sul Ross University, is offering *PLOT, Graphics Terminal Control Software. *PLOT is described as an "...interactive terminal program that solicits and accepts input from the ...CRT... Both commands and data are read in and interpreted in

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Soft Tips

SOFT TIPS is a regular column aimed at providing software oriented hints and ideas for non-programmers. Members are encouraged to send in tips that can help a user better use his/her system. SOFT TIPS is designed to put forth ideas that are general in nature. The column is edited by Norman Vadnais, President of Computer Specialists & Associates, an Orange County Customer Support Specialist. Member's contributions can be sent to SOFT TIPS in care of I/O News.

Letting CROMIX Run Your System

The group capability of the CROMIX Operating System (SOFT TIPS, I/O NEWS Vol. 2 No. 6) is accounted for in various Cromemco supplied utilities. These utilities usually have a '-g' option that allows group-type operation versus user-type. Utilities which can incorporate the use of groups include: Access, Chowner, L, Mail, and Passwd.

Access can modify the access privileges of a file and therefore can modify the access privileges of the group owning the file. Chowner, with a '-g' option, can be used to change the group owning the file. The L command includes an undocumented option of '-g' that, when combined with the -l option, lists the group owning the file (in place of the user owning the file). The electronic Mail command of CROMIX, again through use of a '-g' option, allows mail to be sent to all members of a certain group simply by listing the group name or number in the command line.

Finally, the password utility, Passwd, allows quick updates of group passwords and the addition of new groups in the /etc/group file. All references to a group, its name, or its members are made by CROMIX through the /etc/group file, so be sure to keep it up to date.

System Programmers Corner

For those of you who dabble in assembly programming, the System Programmers Corner will try to keep you informed and offer you a forum to discuss your findings. This section, however, will only offer operating system type features and hints, versus the latest sorting algorithm. If you have any ideas to contribute to the SPC, please forward them to SOFT TIPS, in care of I/O News.

For those of you operating in CROMIX, the .trunc system call does not work properly. The call will shrink the size of the file, but will not always free up the abandoned blocks properly. The process can be noted by users of Screen who work on large files and often delete major sections of them. This call has been a problem since CROMIX's inception (does anybody remember version 10.01?) and hopefully it will be taken care of soon.

New CROMIX Version

With the advent of the HD20, Cromemco released updated versions of their Operating Systems. Unfortunately, we have discovered many items that bother us in the newest versions of CROMIX (we have not had much time to tackle CDOS). We pass these along to users who may have recently upgraded to versions 11.16 or 20.14, in the hope you will not run across these problems without forewarning. All items have been passed on to Cromemco, who is diligently working on their modification.

The first item to note is the new CDOS Simulator (ver. 2.55). This simulator **can cause difficulty** with many CDOS and CP/M based software packages. Cromemco has now started including notices to all users that they should probably use their previous sim.bin versions to avoid some of these problems, and we agree.

Terminal modes are another item we have noticed acting in a new manner. This situation occurs only on terminals attached to quadarts that are not the system console. These terminals, when their main processes are killed through use of the kill command, lose all of their mode settings. This came to our attention with the use of the Logoff

command file (SOFT TIPS, I/O NEWS Vol. 2 No. 6). This does not happen to the system console or to any terminals attached to tuarts. What really bothers us: Why are terminals attached to quadarts treated differently than others?

We have noted many other minor problems, including quite a few in the new Screen Editor. Most of these do not directly affect proper operation of the system. Hopefully, most of these items can be taken care of soon. We will keep you posted.

Handy Command Files

Last time we discussed CROMIX's ability to make decisions through the **if** command. At the time we discussed the capability of comparing two strings. There are two other decision making capabilities built into the if command: the ability to detect error conditions in the previous programs and the ability to detect access modes for given files. In this issue, we will discuss both capabilities.

The error detect mode of the CROMIX If command tests the error condition of the previously executed program. The syntax of the command line is: **if -err command**. The command will be executed if the termination status of the previous command is non-zero, i.e. there was an error in the previous program. Many CROMIX utilities provide the required termination status. The most handy of these is the **testinp** utility, which will be covered next time around. This form of the if command is most often used to abort command files when errors occur during crucial utilities.

The access modes form of the if command will test a user's access mode to a certain file specified in the command line. This test can be used for many purposes, including verifying that a command sequence will work before execution (see the first command file below) or to determine the status of a certain user. The proper command line syntax is: **if -rewa filename command**. Any or all access modes (**Read, Execute,**

Continued on page 31

32 K Classroom

32K Classroom is a regular column aimed at explaining some programming techniques using 32K Structured BASIC. The main emphasis is on "how to" with secondary emphasis on coding effectiveness. 32K Classroom is edited by Michael Turnage, President of Turnage & Turnage, Ltd., a software development company in Sunnymead, California.

Readers Respond

Leo Greenberg, Ph.D., in Raanana, Israel, author of **Expert System in Occupational Safety and Health Engineering** which appeared in Vol. II, No. 5 of I/O News, sent the following:

"I am writing in reaction to the 32K Classroom in Vol. III, No. 2. For the past two years, I have worked quite intensively with both 16K and 32K BASIC, doing a lot of file handling. I have sweated blood in the process because both language manuals provide inadequate information on file handling. Here and there, in the manuals, you will happen upon some of the important and required information, but you'll probably not appreciate its importance until much later.

The instructions which appear in the referenced article seem right, and by rights should be, but some of them—at least in my experience—are not.

One of the tricky features is shown in statements 300 and 530. From my experience, the variable used to serve as the index of the record location (B and I), must first be declared an integer. Otherwise, if you try to read the record, you'll find that there is nothing there.

By the way, another very important point to bear in mind is that the variables read from a file must be of the same type as those written. Hence, if you wrote variables A, B, and C, and variable B had been declared an integer, then you had better read it in the same manner. Otherwise, frustrating and maddening trouble.

Now we come to another maddening item: string handling. Statements 30, 50, 350, 450, etc., seem right. But they're not. Try them. After having filled variable A\$, and blanked it as in 350, print it and see if you get all blanks. In my experience, it just doesn't work, and this is something about which a user must become well aware, else some very

nasty results. In the case shown in statement 350, the first six positions of A\$ will be blanked; not the entire string. To clear the entire string, do the following:

**For I = 0 to 46
A\$(I,I) = " ":" NEXT I**

Yours sincerely,
Leo Greenberg

And from Bernie Thomas in Nashville, Tennessee came the following corroborating comments:

"In 32K Classroom, Vol. III, No. 2, there are two errors I would like to point out, as well as a couple of suggestions I would like to make for the benefit of anyone who might have read it with the intention of learning 32K Structured BASIC.

First of all, the String Variable A\$ is dimensioned 46, which means it has a length of 47 bytes (0 thru 46). If you wish to file A\$ correctly and completely, then the file Sample.dat MUST be opened as \2,47\, not \2,46\ as stated in the article.

Second, if the record number B\$ is stored in the manner programmed in lines 390 thru 420, then a portion of the first record will be overwritten. I have no earthly idea what is meant by, "The major difference is the channel number has been changed to four (4)." This comment has absolutely no bearing on the physical structure of the file. BASIC, as it is shipped, has eight channels, and zero is the CRT. If two files are opened at the same time, then they must be opened on different channels. Regardless of what channel is used to open a file, IT IS THE SAME FILE.

If you wish to fill A\$ with spaces as in Line 50, you merely say A\$ = " " + A\$(-1). A good demonstration of this is to say Dim A\$(46), and then say A\$ = "x" + A\$(-1), and then say Print A\$. Having done this, you can not only see that A\$ is filled with x's, but that there are 47 of them, not 46.

Lines 130 thru 160 are examples of wasteful programming, and if the menu "...grows as additional segments are added ...," it will become even more wasteful. "If" statements take quite a bit of memory, and as the menu gets bigger, more "if" statements will be required. The following example is offered as a better way to solve the problem:

**130 If Sel\$ >= "A" and
Sel\$ <= "z" then
Sel\$ = Chr\$(Asc(Sel\$) - 32)
140 P = Pos("CRF", Sel\$, 0) + 1: If
P = 0 then goto menu
150 On P Goto Createf, Read,
Theend**

If Sel\$ is lower case, then Line 130 converts it to upper case. Line 140 sets a value to the variable P by using the POS function, which is described fully on page 216 of the 32K manual. Line 150 uses the On-Goto function (page 129 - 32K manual) to direct the program to the desired line label. As the menu grows longer, you merely add the appropriate letters to "CRF" in line 140, and the line labels or line numbers in Line 150.

The #137 Error Message (**Cannot Create File**) is trapable, and I would suggest the inclusion of a Line 175:

**175 On error Goto 180: Erase
"Sample.dat"**

and then change Line 180 to read:

**180 On error stop: Create
"Sample.dat"**

I would also like to add that this type of article is much like a serial, in that it is to be concluded in future issues. Serials are fine for weekly, or even monthly, publications, but for a publication which is published as seldom as I/O News, they are not. Anyone interested in 32K BASIC is not going to wait that long for such elementary instruction.

A much better use of such an article would be to clarify the things which are not made clear in the manual, such as the use of a Data Statement, On Val-Goto, etc.

Respectfully,

Bernie Thomas

Thank you both, very much, for your input. As noted, you have both added to the educational value of 32K Classroom, for which we are grateful. Ed.



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Continued on next page

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Continued on next page

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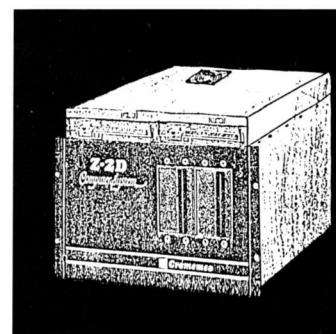
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Continued from page 22

bits & bytes, nibbles & tweaks

real time." For further information, contact Professor Ofenstein through his company:

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Our Source for Plotter Interface Software...

is Russ Campbell in Boise, Idaho. For over two years now we have been referring users to Russ whenever they need to interface their systems to Tektronix or H-P plotters. He has informed us that he also has a bank relocator that gives a user 64K CDOS space by moving CDOS to another bank. Russ is very creative and has been a Cromemco user since the company's inception. For information on all his various developments, contact:

Russ Campbell, Ph.D.
1200 Holden Lane
Boise, ID 83706
Phone: (208) 345-7648

Another Ingerman Tidbit

Peter Zilahy Ingerman, the erudite systems consultant from Willingboro, New Jersey, sent us the following: "I caught myself in a trap for the second time in three years, and decided it was worthwhile writing you a letter about it.

I had written a program in assembler, which displayed the following symptom: it would operate perfectly while running under DEBUG, but produced erratic and inconsistent results when I attempted to execute it directly.

In both cases, I had absent-mindedly neglected to set the stack pointer to the top of memory. DEBUG apparently does this piece of housekeeping as a courtesy before beginning to process. The operating system, on the other hand, does not."

Thanks, Peter. I hope others will benefit from your experience. Editor

The C-10 Technical Manual...

is available from any Cromemco dealer for \$35.00, and I've been told it is a MUST for C-10 users. It contains several features not documented in the user manual including graphics information and clock-setting data, both subjects we have touched on in prior issues.



Write, or Append) can be listed on the command line. If the user has the access privileges listed, command will be executed. If filename does not exist, command will never be executed.

Next time around, we will cover the input and testing utilities of CROMIX and see how they can help us create more useful command files.

Name: ED

Purpose: Allows editing of multiple files by the CROMIX Screen Editor. Will first verify executability of Screen by this user in the current directory.

Setup: The link supplied by Cromemco between /bin/screen.bin and /bin/ed.bin must be deleted by the user.

Listing:

```
%access _ok?  
if -rw . goto start  
/bin/echo -e '^GInvalid access'
```

```
privileges'  
exit  
%start  
/bin/echo  
/bin/echo 'File --> #1'  
/bin/echo  
/bin/screen #1  
shift  
if .#1 != . goto start  
/bin/echo
```

Notes: The access _ok? section of the command file tests for the proper access privileges in the local directory (labelled '.' in the if command line). Screen requires both read and write access for the directory. Therefore, this command file will abort with an error message if the user does not have these access privileges. The '-e' option of the echo command puts the error message on the standard error channel (where all error messages should be displayed). The rest of the command file handles the Screening of multiple files. Before each file is Screened, it is identified on the terminal to the user with the three Echo commands. Then the file is Screened as normal. Once the user exits Screen, the command line is rotated with

the shift command to look at the next filename listed. The If command tests to verify that another file is listed. If #1 is not blank, the command file will return to start and Screen the next file. If #1 is blank, there are no more files and the If command is ignored. The command file is then exited after printing a blank line.

Example:

```
% ed letter.1 letter.2  
File --> letter.1  
CROMIX Screen Editor version  
01.40 <<<edit file as usual>>>  
>Exit: Update  
824 bytes written to: letter.1  
File --> letter.2  
CROMIX Screen Editor version  
01.40  
<<<edit file as usual>>>  
>Exit: Update  
637 bytes written to: letter.2  
%
```



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Simultaneous Queued Output to Two Printers Under CROMIX

by Leigh R. Thomas

CROMIX has the capacity to have two or more printers on the system and the spool utility may be used to direct output to any nominated printer. Spool, however, does not have the capacity to send output to two or more printers simultaneously.

For users with two or more printers who desire simultaneous printing to increase throughput, this article describes a set of command files and associated directory structure whereby simultaneous printing is possible with an orderly queue maintained for each printer.

The core of the solution is the command file .PSCAN.CMD, the listing of which is shown. A new directory must be created for each printer on the system, named /USR/PRINTER1, /USR/PRINTER2, etc. PSCAN resides in, and is invoked as a background job in, each of these directories at system startup. Thus the startup.cmd file would include instructions like,

```
/use/printer1/.pscan &
/use/printer2/.pscan &
```

Note that, although the command file is referred to as PSCAN in this description, its true name is .PSCAN.CMD, the leading period making it invisible, which is important as will be described.

The directories, PRINTER1, PRINTER2, etc., in addition to providing a home for the PSCAN command files and the associated files which PSCAN creates as it operates (which, incidentally, are also invisible) are also intended to have linked into them all files which are to appear as

print output on the physical printer associated with the directory.

For example, should a site have both a parallel dot-matrix printer (say /dev/lpt1) and a type-writer-style letter quality printer (say, /dev/typ1) then these two printers are notionally given the numbers "1" and "2". Files to be printed on the dot-matrix device must be moved, copied or linked into the directory /USR/PRINTER1 and likewise, files to be printed on the other printer must appear in /USR/PRINTER2.

A copy of PSCAN must reside in, and be invoked in, each of these directories. The general structure of the PSCAN command file is the same in each directory but the physical printer accessed by PSCAN is different in each case. The listing shown assumes the device /dev/lpt1. Users must alter this in the two places it occurs in the PSCAN.CMD listing depending upon the physical device to be accessed by that particular PSCAN file.

The principle of operation of PSCAN is simple but some of the detail is a little complex.

On initial startup; PSCAN deletes the two temporary files and the two other command files it normally creates for itself and directs any harmless errors to the null device. Then, using echo with a redirection to a file it proceeds to create an invisible command file named XO.CMD which it will later invoke to print files to the nominated device. The structure of these two echo statements may at first look a little strange. The intention is to write, in addition to other

characters, the string "#1" into the file XO.CMD. A double set of quotation marks must be used instead of the familiar single set in most echo commands with the split occurring between the "#" character and the "1" character. If this is not performed in the way shown then PSCAN would attempt to echo an argument (its own #1) rather than the literal characters "#" and "1". It then enters the main programme loop (%start).

The first task of this loop is to build the first part of a new invisible command file named X1.CMD. X1 will ultimately be used to invoke XO and will also pass to XO as an argument (#1) the name of the file to be printed.

Essentially PSCAN functions by taking a brief, summary listing of the directory it resides in (the l - bs command). This list will reveal only non-invisible files, so the various files PSCAN creates and PSCAN itself will not appear in the list despite the fact that they reside in the same directory. The list will thus contain the files a user desires to print, with a summary line appended containing the number of files revealed, the number of blocks used and the total byte count. A redirection passes this list into an invisible file named TEMP. The sort utility is invoked next, with TEMP specified as the input file and a new (invisible) file STEMPSPECIFIED as the output file for the result of the sort operation. The default operation of sort is to

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place first any lines found which begin with a numeric character, so the list of the directory which resides in TEMP with the summary as the last line becomes replicated in STEMP with the vital difference that the summary line is now the first line of STEMP.

A reverse-sense testing function testing the first character only is invoked next on the STEMP file. Depending upon the contents of the directory, STEMP may be a multiple-line file. Nevertheless, testing tests the first line only of the file. The character checked for is 0 (zero). Should it be that the directory is empty of (non-invisible files, the summary section of the list will begin with a zero. Since this line is the first entry of STEMP, the error flag will be set if zero is found (the reverse-sense test) and branching occurs to %wait.

Wait simply puts the process to sleep for 30 seconds. Upon awaking the temporary files and the XO command file (which has not been used if the directory was empty) are deleted and the loop is re-entered. This process will continue indefinitely.

Should one or more non-invisible files be found by the list function, the summary line will not begin with zero so branching to %wait does not occur. The printing function of PSCAN is then invoked.

The input function is invoked on the file TEMP (which contains a list of the files in the directory awaiting printing) by the virtue of an input redirection. Again, TEMP may be a multiple-line file but input will extract the first line only. The same statement line in PSCAN redirects this first line to append the invisible command file X1.CMD. Now, X1.CMD will contain something like,

.XO thisfile

where "thisfile" is simply the first file name in the list.

Now activity at the nominated printer begins. A control-L (form feed) is sent first and then X1.CMD is invoked. X1 simply invokes XO with the useful addition that the file name to be printed is available to XO as argument 1 (#1) as it appears on the line which calls XO.

Thus, XO, which simply contains, ty #1 > /dev/lpt1 (or any printer

device)
del #1
firstly prints the file, then deletes it from the directory. Control then loops to deleting the temporary files and the process is re-entered. Since "thisfile" was printed last time and deleted from the directory, the list passed to TEMP will now have either zero entries or the remaining entries and the process is repeated.
Simultaneous printing is, of course, achieved by this process running in two or more directories simultaneously for as many printers as necessary.
Thus an orderly queue is maintained for two printers providing a function rather similar to spool. Unlike spool however, multiple copies are not possible, a low priority is not set (but could be if desired in PSCAN itself) and files are not necessarily printed in the order they are sent to the directory. Rather, they are printed in alphabetical order, as this is a feature of the list utility used to establish the queue.
Users of wordprocessing software in particular may find this command file set useful, where files are "printed" to a file first, not to the printer, then manually sent to either PRINTER1 or PRINTER2 directory as required for output.
Finally, a quick and reasonably user friendly command file may be invented to send a nominated file from a user to the appropriate directory. A command file listing to achieve this, named PRINT.CMD, is shown.

```
NAME = PRINT.CMD
Called by PRINT printer.No. filename
example PRINT 1 thisfile
if .#1 = . goto error
if #1 = 1 goto ok
if #1 = 2 goto ok
if .#2 — . goto error
goto error
%
%ok
%
maklink #2 /usr/printer#1
echo "File #2 will be printed in a
moment"
ex
%
%error
echo "Incorrect format"
echo "Format is PRINT printer.No.
filename"
echo "Allowable printer numbers are
1 and 2"
%
ex
```

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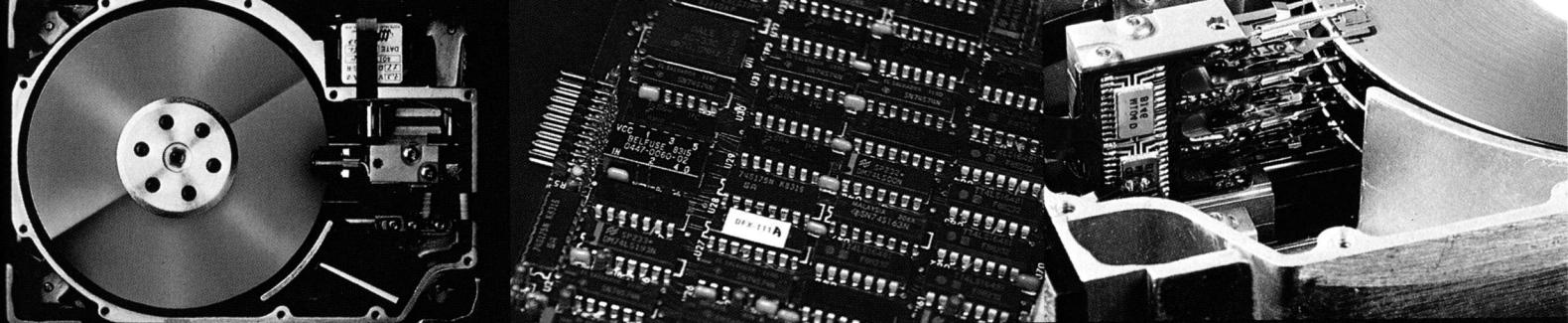
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